ANTENATAL RISK FACTORS, CLINICAL PROFILE AND EARLY OUTCOME OF PRETERM BABIES

Dissertation submitted to

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GOVT.STANLEY MEDICAL COLLEGE & HOSPITAL

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CERTIFICATE

This is to certify that the dissertation entitled *"**ANTENATAL RISKFACTORS, CLINICAL PROFILE AND EARLY OUTCOME OF PRETERM BABIES"*** is a bonafide original work of **Dr. P.MURUGALATHA**, in partial fulfillment of the requirements for **M.D.BRANCH- VII (PAEDIATRICS)** EXAMINATION OF THE Tamilnadu Dr. M.G.R. Medical University to be held in March 2008.

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DECLARATION

I, **Dr. P.MURUGALATHA**, solemnly declare that dissertation titled, ***"ANTENATAL RISKFACTORS, CLINICAL PROFILE AND EARLY OUTCOME OF PRETERM BABIES"*** is a bonafide work done by me at Institute of Social Pediatrics, Govt. Stanley Medical College & Hospital during the period of September 2007 to September 2008 under the guidance and supervision of my **Prof. Dr. M.L.VASANTHAKUMARI, M.D, D.C.H,** Director, Institute of Social Pediatrics. The dissertation is submitted to Tamilnadu Dr. M.G.R. Medical University, towards partial fulfillment of requirement for the award of **M.D., Degree (Branch-VII) in Pediatrics**.

Place: Chennai

Date: (**Dr.P.MURUGALATHA**)

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INTRODUCTION

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KANGAROO MOTHER CARE

INTRODUCTION

Preterm birth is one of the major clinical problems in obstetrics and neonatology as it is associated with perinatal mortality, serious neonatal morbidity and in some cases childhood disability. Preterm labour and delivery are very challenging obstetric complications encountered by obstetricians, as are preterm neonates for the pediatricians.

Preterm labour is defined as the onset of labour prior to 37 completed weeks of gestation (i.e.) 259 days from first day of last menstural period. Preterm delivery affects one in 10 births (11%) in USA and varies between 10–69 % in developing countries and causes 40–75 % neonatal deaths.

Due to continued innovation in neonatal intensive care facilities and obstetric interventions, fetal survival is now possible even at 20 weeks gestation in developed countries. However in even the best setups in developing countries, salvage is rare below 28 weeks of gestation. Preterm birth is rising worldover because of increased frequency of multiple births due to assisted reproduction techniques (ART), more working mothers, increasing psychological stress and medically induced prematurity. However during the last two decades, the survival for the premature infants has significantly increased due to advancement in perinatal and neonatal treatment expertise and improvement in the care of high risk mother. The survival rate has increased from 10% to 50–60%.

The survival of Preterm birth especially when born less than 34 weeks of gestation require to remain in NICU. They need to spend time in NICU till close to term to allow for sufficient multiorgan maturation resulting in prolonged hospital stay for both mother and infant. Therefore the consequence of preterm birth often continue beyond the neonatal period and can lead to significant direct and indirect costs that have to be borne by parents and society. Hence it is a time felt need to ascertain maternal antenatal factors contributing to preterm birth and need for improvement of perinatal care to increase the neonatal survival.

Hence comes this prospective study of maternal risk factors, clinical profile and early outcome of preterm babies till discharge.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

Prematurity

What is prematurity?

A baby born before 37 weeks of pregnancy is considered premature, that is, born before complete maturity. Slightly fewer than 12 percent of all babies are premature. Overall, the rate of premature births is rising, mainly due to the large numbers of multiple births in recent years. Twins and other multiples are about six times more likely to be premature than single birth babies. The rate of premature single births is slightly increasing each year.

According to the March of Dimes, about 12 percent of babies born in the US are born preterm, or before 37 completed weeks of pregnancy. Of the babies born preterm:

- 84 percent are born between 32 and 36 weeks of gestation
- about 10 percent are born between 28 and 31 weeks of gestation
- about 6 percent are born at less than 28 weeks of gestation

Other terms often used for prematurity are preterm and "preemie." Many premature babies also weigh less than 2,500 grams (5.5 pounds) and may be referred to as low birthweight (LBW).

Premature infants born between 34 and 37 weeks of pregnancy are often called late preterm or near-term infants.

What causes prematurity?

There are many factors linked to premature birth. The following factors may contribute to a premature birth:

- **Maternal factors:**
    - preeclampsia
    - chronic medical illness (such as heart or kidney disease)
    - infection (such as group B streptococcus, urinary tract infections, vaginal infections, infections of the fetal/placental tissues)
    - drug use (such as cocaine)
    - abnormal structure of the uterus
    - cervical incompetence
    - previous preterm birth

- **Factors involving the pregnancy:**
    - abnormal or decreased function of the placenta
    - placenta previa
    - placental abruption
    - premature rupture of membranes
    - polyhydramnios
- **Factors involving the fetus:**
    - when fetal behavior indicates the intrauterine environment is not healthy
    - multiple gestation (twins, triplets or more)

Why is prematurity a concern?

Premature babies are born before their bodies and organ systems have completely matured. These babies are often small, with low birthweight (less than 2,500 grams or 5 ½ pounds), and they may need help breathing, eating, fighting infection, and staying warm. Very premature babies, those born before 28 weeks, are especially vulnerable. Many of their organs may not be ready for life outside the mother's uterus and may be too immature to function well.

Some of the problems premature babies may experience include:

- temperature instability
- respiratory problems:
    - hyaline membrane disease/respiratory distress syndrome
    - chronic lung disease/bronchopulmonary dysplasia
    - air leaking out of the normal lung spaces into other tissues
    - incomplete lung development
    - apnea - occurs in about half of babies born at or before 30 weeks
- cardiovascular:
    - patent ductus arteriosus (PDA)
    - Hypotension or Hypertension
    - Bradycardia
- blood and metabolic:
    - anemia
    - jaundice

    - Hypoglycemia
    - Hypocalcemia
    - Hyperglycemia
- gastrointestinal:
    - difficulty feeding - many are unable to coordinate suck and swallow before 35 weeks gestation
    - poor digestion
    - necrotizing enterocolitis (NEC) -
- neurologic:
    - intraventricular hemorrhage
    - periventricular leukomalacia
    - poor muscle tone
    - seizures
    - retinopathy of prematurity
- infections

ELECTRONIC WEIGHING MACHINE

What are the characteristics of prematurity?

The following are the most common characteristics of a premature baby. However, each baby may show different characteristics of the condition. Characteristics may include:

- small baby, often weighing less than 2,500 grams (5 pounds 8 ounces)
- thin, shiny, pink or red skin, able to see veins
- little body fat
- little scalp hair, but may have lots of lanugo (soft body hair)
- weak cry and body tone
- genitals may be small and underdeveloped

Treatment of prematurity:

It depends on

- Baby's gestational age, overall health, and medical history
- extent of the disease
- tolerance for specific medications, procedures, or therapies
- expectations for the course of the disease

Treatment may include:

- **prenatal corticosteroid therapy**

Research has found that giving the mother corticosteroid at least 48 hours prior to delivery greatly reduces the incidence and severity of respiratory disease (HMD) in the baby. Another major benefit of steroid treatment is lessening of intraventricular hemorrhage. Although studies are not clear, prenatal steroids may also help reduce the incidence of NEC and PDA. Mothers may be given steroids when preterm birth is likely between 24 and 34 weeks of pregnancy.

Care of premature babies may also include:

- temperature maintenance – Radiant Warmer, Incubator.
- monitoring of temperature, blood pressure, heart and breathing rates, and oxygen levels
- giving extra oxygen by a mask or with mechanical ventilators.
- intravenous (IV) fluids - when feedings cannot be given, or for medications

SGA BABY IN INCUBATOR

- x-rays (for diagnosing problems and checking tube placement)
- Special feedings of breast milk by nasogastric tubes / paladai.
- medications and other treatments for complications
- Kangaroo Care - a method of caring for premature babies using skin-to-skin contact with the parent to provide contact and aid parent-infant attachment. Studies have found that babies who "kangaroo" may have shorter stays in the NICU.

When can a premature baby go home from the hospital?

General goals for discharge may include the following:

- serious illnesses are resolved
- stable temperature
- taking all feedings by breast
- no recent apnea or bradycarcdia
- parents are able to provide care including medications and feedings

Prevention of prematurity:

Because of the tremendous advances in the care of sick and premature babies, more and more babies are surviving despite being born early and

being very small. But prevention of early birth is the best way of promoting good health for babies.

Prenatal care is a key factor in preventing preterm births and low birthweight babies.

- identifying mothers at risk for preterm labor
- prenatal education of the symptoms of preterm labor
- avoiding heavy or repetitive work or standing for long periods of time which can increase the risk of preterm labor
- early identification and treatment of preterm labor

Risk Factors for Early Delivery

Alison Stuebe, et al, Boston, **February 2006**

Up to two-thirds of women who deliver their babies early have no risk factors. The remaining one-third of women who deliver early have one of the following risk factors (listed in order of importance):

- multiple gestation (more than one baby in the womb)
- history of preterm birth;

- vaginal bleeding in the middle of pregnancy;
- infection;
- polyhydramnios
- Cervical incompetence
- Uterine anomalies
- genetic, economic, and social factors .

Multiple Gestation

A mother has increased risk of developing

1) preeclampsia (20 to 33% of all multiple pregnancies)
2) Gestational diabetes. Over 50% of twins and about 90% of triplets will have low birth weight compared to about 6% of babies born from single pregnancies.

History of Preterm Birth

A woman who has delivered a preterm baby in the past has a 15 to 40% chance of preterm labor and delivery in subsequent pregnancies.

History of Abortion

Some studies have found an association between a history of abortion and subsequent preterm births

Infection

Bacterial infection may cause up to 30% of all preterm labors.

The infection can be localised [(ie) reproductive or urinary tract] or systemic.

Polyhydramnios

Up to 40% of women with polyhydramnios start labor early.

Birth defect – 39%

Diabetes – 22%

Problems with the Cervix

- Cervical trauma – cervical insufficiency
- Operations in the cervix

Problems with the Uterus

- Septate uterus
- Unicornuate \ Bicornuate uterus
- If a women had a complete septum, baby's survival rate was 86%, if bicornuate, 50% chance for survival and if unicornuate, dropped to 40%.

Genetic, Economic, and Social Factors

Genetics and Race

Certain inherited traits can increase a woman's risk for preterm labor. These include being underweight for one's height. Having parents who are closely related to each other (inbreeding) also increases a woman's risk.

African-American women have an increased risk for preterm labor. For example, African-American women (in comparison to Caucasian women) are 1.5 times more likely to deliver a baby at 36 weeks but almost four times more likely to deliver a baby at less than 28 weeks

Economic Factors

A poorer woman is more likely to deliver prematurely or to have a very small infant.

Social Factors

A number of social factors affect a woman's risk for preterm labor. Her risk increases if she:

- is less than 16 years old or more than 40 years old;
- is single;
- drinks alcohol, uses recreational drugs, or smokes (smoking can double the risk of premature birth);
- lacks social support, like a family or community network (this is especially problematic if a woman is caring for several children under six years old or if she lacks transportation for prenatal care); and
- suffers from physical or psychological stress

Weight, sex, affect early preterm survival

John Toyson etal, Houston, April 16,2008

For babies born extremely early, new research shows that 4 factors aside from the baby's gestational age – may affect their odds of survival if given intensive care.

The 4 Factors are

- Sex (survival is better for girls)
- Single birth or multiple birth (survival is better for singletons)
- Mother's treatment with corticosteroids before giving birth to help the baby's lung's develop (a plus for preemie survival)
- Birth weight (the higher the better)

Lucile Packard children hospital, Stanford, 2008 march of times

- 13% us preterm
- 71% born between 34 – 36weeks.
- 13% 32 – 33 Weeks of Gestational age
- 10% 28 – 31 Weeks of Gestational age
- 6% < 28 Weeks all premature babies are at risk for health problem, but those baby born < 32Weeks face highest risk.

These babies are very small, organs are less developed but with improved NICU care chances of survival have improved even these smallest babies.

Michael G Ross et al, Los Angeles, (Article, Aug12, 2008),

- Preterm birth occurs in 12% of pregnancies
- Leading causes of neonatal mortality in US
- 70% of neonatal morbidity, mortality and health care dollars spent on the neonate.
- 2% delivering very premature infant <32 weeks.

Exact mechanism is unknown but is believed to include

(a) Decidual hemorrhage (e.g. abruption, mechanical factors such as uterine over distension from multiple gestation or polyhydramnios)

(b) Cervical incompetence (Trauma, Conebiopsy)

(c) Uterine distortion (Mullerian duct abnormalities, fibroid uterus)

(d) Cervical inflammation (from bacterial vaginosis, trichomoniasis)

(e) Maternal inflammation, fever (e.g. UTI)

(f) Harmonal changes (maternal stress / fetal stress)

(g) Uteroplacental insufficiency (e.g. Hypertension, IDDM Drug abuse, smoking, alcohol consumption)

Although prediction remains inexact, a variety of maternal and obsetric characterics are known to increase the risk, presumably by one of these mechanisms. Finally the foetus plays a role in iniation of labour.

Also includes demographic factors, behavioural factors, aspects of obstetric history such as previous preterm birth.

- Demographic factors – non white race
- Extremes of meternalage (< 17 , or > 35 years)
- low Socio economic status.
- Low Pregnancy weight

Others – Stressful life situation (Domestic violence, close family death)

Insecurity over food, home, partner, work, home environment

Neonatal morbidity and mortality by gestational age

Gestational age	Survival	Respiratory Distress Syndrome	IVH	Sepsis
24 – 26 Weeks	40 – 75%	70 – 93%	25 – 30%	25 – 30%
27 – 29 Weeks	80 – 92%	53 – 84%	3 – 16%	25 – 36%
30 – 34 Weeks	93 – 95%	28 – 55%	1 – 2%	3 – 11%
32 – 34Weeks	93 – 97%	14 – 34%	0%	4 – 5%

Singh uma et al, lucknow, prespective analysis of etiology and outcome of preterm labour.

Maximum number of women (48.5%) were in the gestational age group of 34 – 36 weeks 48.1% received tocolysis and out of which and 61.0% delivered prematurely. Among the various risk factors, premature rupture of membranes was found to be the most common cause (25.96%) followed by infection, UTI was found in 8.4%. Neonatal mortality was quite high in babies less than 34 weeks gestation (30.4%). Betamathasone had not affected mortality incidence in babies born < 34weeks. Neonatal morbidity was significantly reduced in cases where some time was gained for betamethasone coverage

and incidence of RDS was significantly less in this group.

14.4% had history of preterm deliveries and 44(10%) had one preterm delivery and 16% (4.8%) had two or more. 14.4% had prior abortions.

Neonatal hyperbilirubinemia (78%) and RDS (65%) were the most common causes of morbidity in ELBW babies. Over all mortality was 12.7%.

Incidence of Preterm birth and trends.

Country	Preterm birth	Trend
USA (Martin et al)	12.3%	Increasing
United kingdom (Bibby & Stewart)	7%	Increasing
Australia (Robert et al)	5.5%	Stationary
Sweden (Morten et al)	5–6%	Decreasing
China (Leuing et al)	7.4%	Increasing
Zimbabwe (Shingairaj et al)	16.4%	Increasing
India (Singh Uma et al)	20.9%	--

Vander pol found that approximately 30% of Preterm births was due to preterm labour. **Gonclases et al,** intra uterine infection was the major cause of preterm births. **Wright et al** identified UTI as significant risk factor.

Carr – Hill and Hall have shown that in women with history of one preterm delivery there is 15% chance of next preterm delivery and after two preterm deliveries there is 32% chance.

Sehgal et al, Neonatal hyperbilirubinenia and RDS were the most common causes of morbidity in ELBW babies.

Arvind Sehgal,et al 2003. maternal and neonatal profile and immediate outcome in ELBW babies, Overall survival rate was 57%. Mean gestational age was 27.8 weeks and mean birth weight was 831 grams, mortality was highest in babies born < 28 weeks gestation. Commonest morbidity was neonatal hyperbiirubinemia (75%) and HMD/RDS (65%). SGA babies were more when compared to AGA babies. 44% did not receive antenatal care and babies born to them had unfavorable outcome, as compared to those with optimal antenatal care. Gender difference in this study followed male. Among the maternal risk factors, anemia ranked first and among the clinical profile of ELBW neonates, jaundice (78%), followed by HMD/RDS (65%), Hypoglycemia (38%).

The most immediate cause of death was respiratory failure. HMD (63%), Sepsis, IVH/ICH (27%), pulm. hge 18%, were main contributors to mortality.

Roykk, et al study 2006, analysis of immediate nenonatal outcome in VLBW & ELBW babies, overall mortality was higher among boys (26.7%), than girls (16%). Common complications seen was neonatal jaundice, RDS, culture proven sepsis, birth asphyxia. There was higher association of SGA babies, there was higher number of deliveries in

lower socio-economic class and among the maternal risk factors, PROM ranked first followed by Anemia, bacterial vaginosis, gestational hypertension and previous history of preterm delivery. As for as delivery outcome was analyzed, major delivered by caesarean sections followed by vaginal deliveries and breech deliveries.

Wright et al identified UTI as significant risk factors.

AIM OF THE STUDY

- To evaluate the clinical Profile and early outcome (neonatal morbidity and mortality till discharge) of preterm babies
- An analysis of antenatal risk factors of the mothers of preterm babies.

MATERIALS AND METHODS

MATERIALS AND METHODS

Study Design :

Prospective descriptive study – Cohort study.

Prospective analysis of early neonatal outcome (mortality &morbidity) of preterm babies &analysis of antenatal risk factors of the mother.

Study place :

Govt. RSRM Hospital, Stanley Medical college, Chennai.

Study period : September 2007- September 2008.

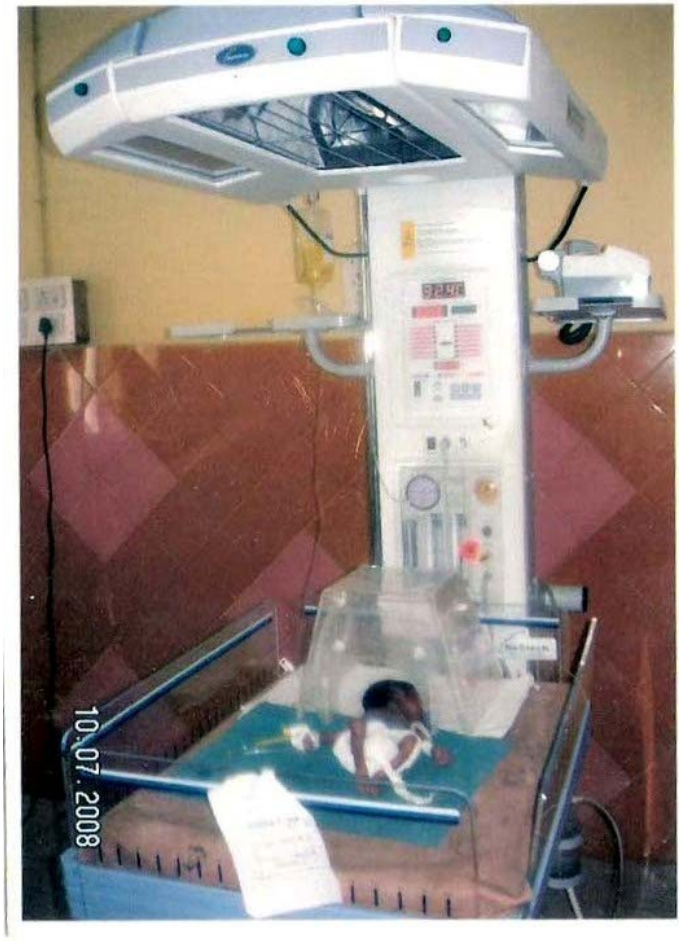
Sample size : 1019 preterm babies.

Inclusion criteria :

- Preterm babies born between 22 weeks to 36 weeks + 6 days.
- Preterm babies with birth weight SGA, AGA and LGA.

Exclusion criteria :

- Preterm babies born who are still born.



SGA BABY UNDER RADIANT WARMER

Methodology :

- Preterm babies born in labour ward and operation theatres between 22 – 36 weeks + 6 days. delivered at Govt., RSRM hospital, Govt., Stanley medical college were taken in to the study.
- Gestational age was Calculated from mothers LMP and newballard score.
- Babies were Weighed using electronic weighing Machine. With Standard error of $\pm$50 grams.
- Babies were Categorised in to SGA, AGA and LGA by plotting on a chart based on Indian standards common for both sexes.
- Babies with birth weight less than 10^{th} percentile were categorised as SGA, between 10^{th} – 90^{th} percentile were categorised as AGA and above 90^{th} percentile were categorised as LGA.
- Babies were analysed for the following factors till discharge.

  b) Birth of babies

  c) Sex of babies

  d) Asphyxiated babies requiring Ventilatory Support

  e) Morbidity pattern of babies

  f) Mortality of babies.

  g) Causes of mortality of babies.

- Mothers of preterm babies were analysed for the following factors.
    a) Age of the mother
    b) Socio – Economic class
    c) Antenatal care
    d) Maternal weight gain
    e) Maternal risk factors
    f) Treatment profile
    g) Delivery outcome
- Datas collected were filled in colour coded proformas [Pink –Mother, Yellow – Singleton, twin 1, triplet 1, White – twin 2, triplet2 & 3]

Statistical methods used :

The information collected regarding all the selected cases were recorded in a Master Chart. Data analysis was done with the help of computer using **Epidemiological Information Package (EPI 2002).**

Using this software, range, frequencies, percentages, means, standard deviations, chi square and 'p' values were calculated. Kruskul Wallis chi-square test was used to test the significance of difference between quantitative variables and Yate's test for qualitative variables. A 'p' value less than 0.05 is taken to denote significant relationship. If value of 'p ismore than 0.05 then is taken to denote absence of relationship between the two variables.

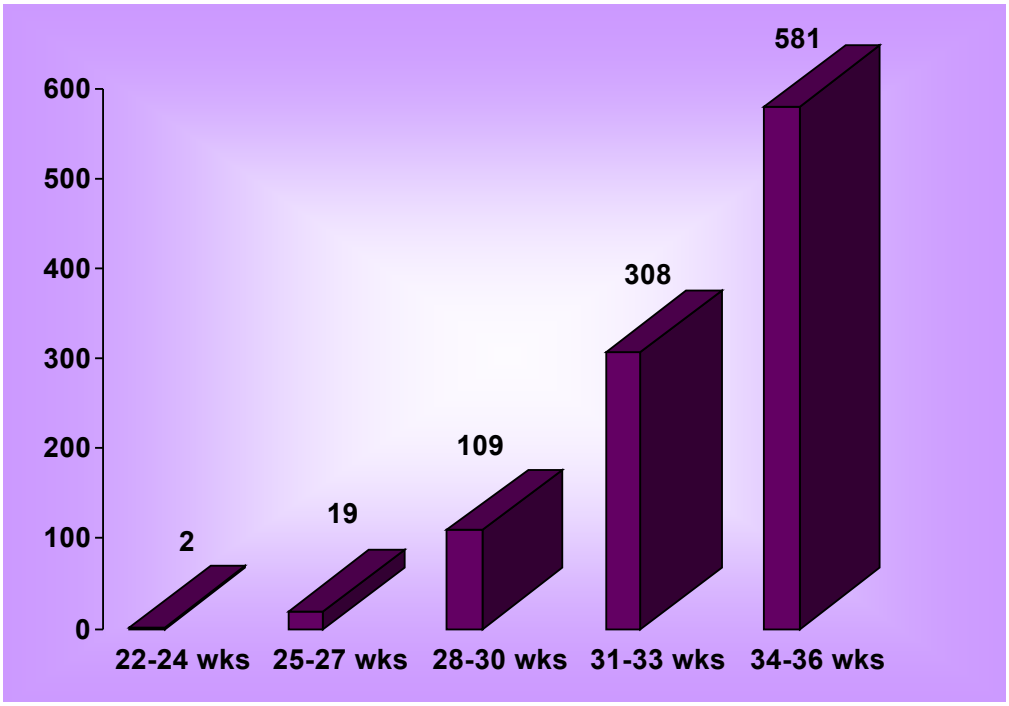
RESULTS
AND ANALYSIS

The results of our study were as follows.

1. **Total number of babies recruited – 1019**
2. **Total number of babies analysed – 1019**
3. **Total number of mothers – 937**
4. **Total number of singletons – 863**
5. **Total number of twins – 132**
6. **Total number of triplets – 24**
7. **Total number of male – 448**
8. **Total number of female – 571**
9. **Total number of SGA babies – 245**
10. **Total number of AGA babies – 752**
11. **Total number of LGA babies – 22**
12. **Total number of male babies died – 101**
13. **Total number of female babies died – 108**

CHART 1

Gestational age



Results & Analysis

Table – I Babies born between various Gestational Ages.

Gestational Age (In Weeks)	Babies	
	No.	%
22 – 24 Weeks	2	0.20
25 – 27 Weeks	19	1.86
28 – 30 Weeks	109	`10.70
31 – 33 Weeks	308	30.22
34 – 36 Weeks + 6 Days	581	57.02
Total	1019	100

57% of babies were born more than 34 weeks of Gestational age.

43 % of Babies were born less than 34 Weeks of Gestational age.

CHART 2

Weight of babies

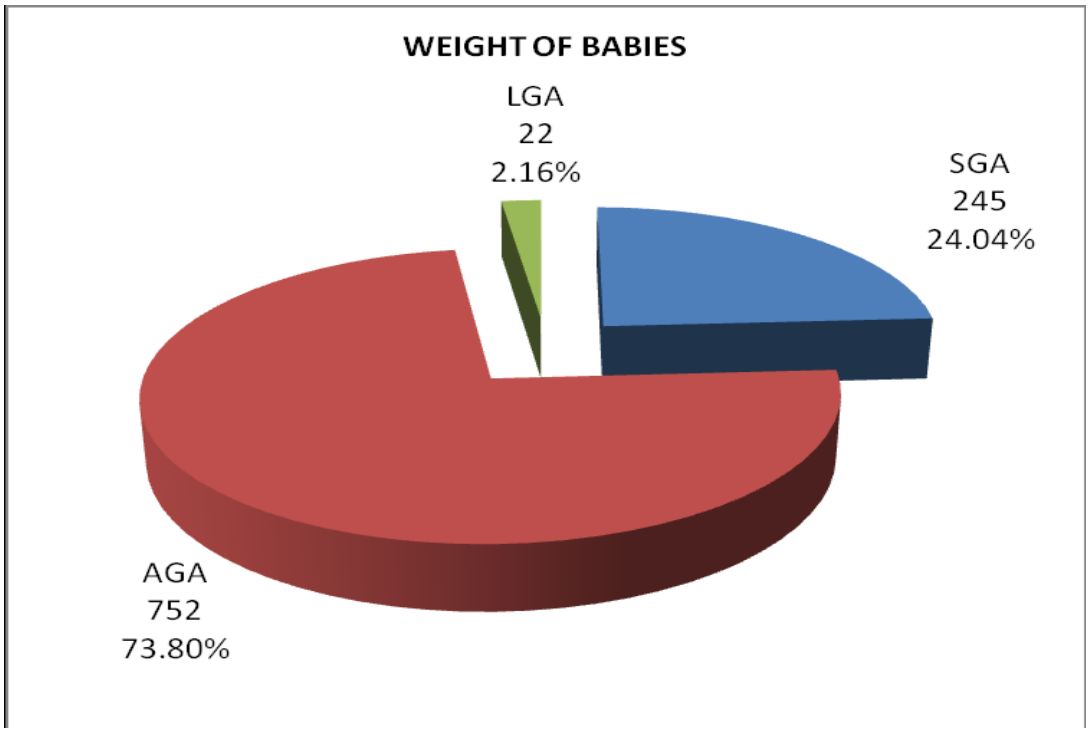


Table II Babies born SGA, AGA and LGA

Birth Weight	Babies	
	No.	%
SGA	245	24.04
AGA	752	73.80
LGA	22	2.16
Total	1019	100

73.80% were AGA babies followed by 24.04% SGA babies and 2.16% LGA babies.

CHART 3

Gestational age and outcome of babies

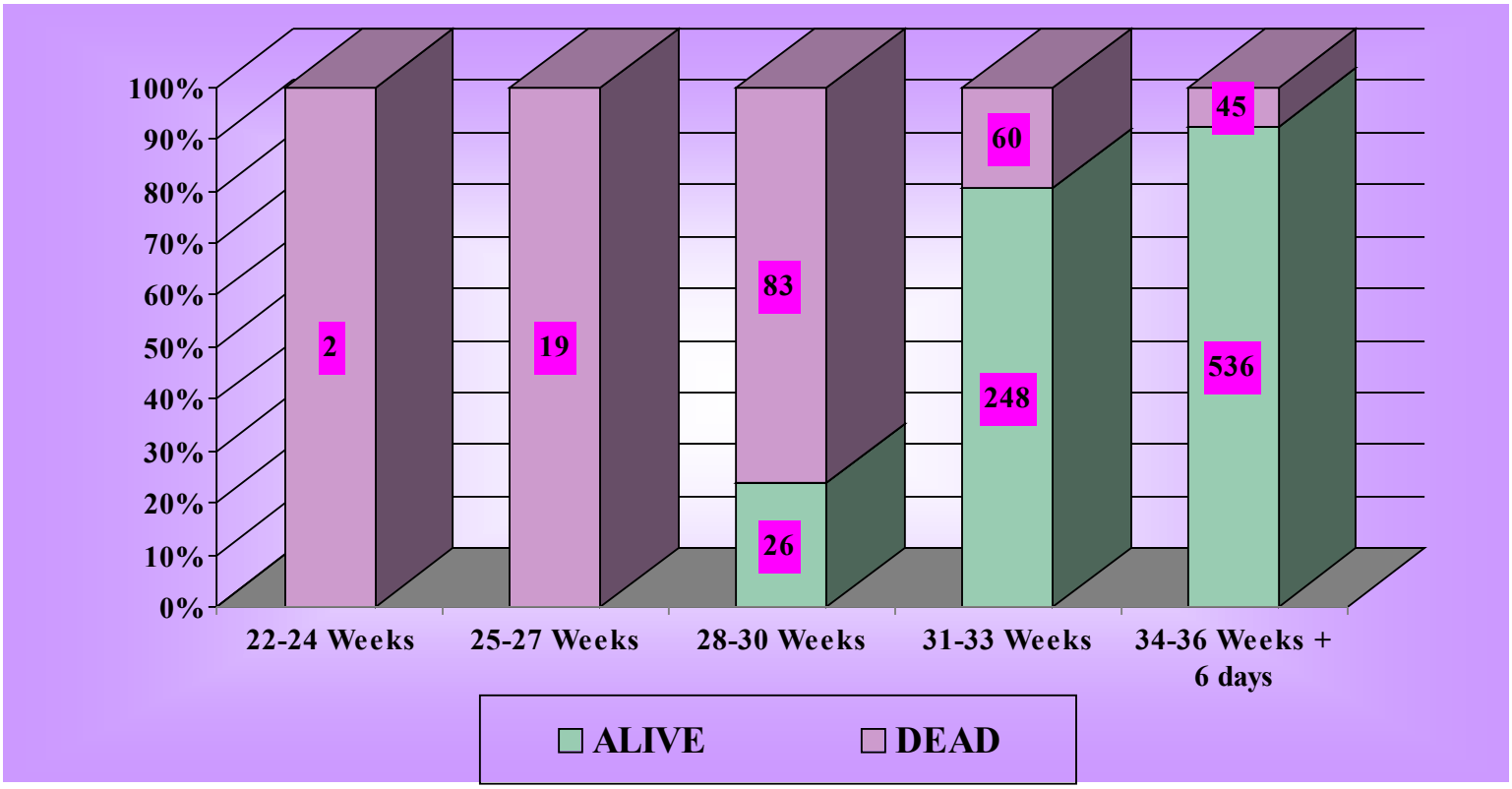


Table III Number of babies born

Number of babies born	Deliveries		Babies born	
	No.	%	No.	%
Singleton	853	92.1	853	84.7
Twins	66	7.0	132	13
Triplets	8	0.9	24	2.3
Total	937	100	1019	100

There were 66 (7%) twins and 6(0.9%) triplets in the pre term babies studied.

Table IV Gestational age and outcome of babies.

Gestational Age (In Weeks)	Alive		Dead	
	No.	%	No.	%
22 - 24 Weeks	-	-	2	100
25 - 27 Weeks	-	-	19	100
28 - 30 Weeks	26	23.85	83	76.15
31- 33 Weeks	248	80.52	60	19.48
34 - 36 Weeks + 6 Days	536	92.25	45	7.75
'P'	0.0001 Significant			

As gestational age increases mortality rates decline. There exists statistically significant relationship between these two variables.

CHART 4

Weight wise Sex analysis of babies

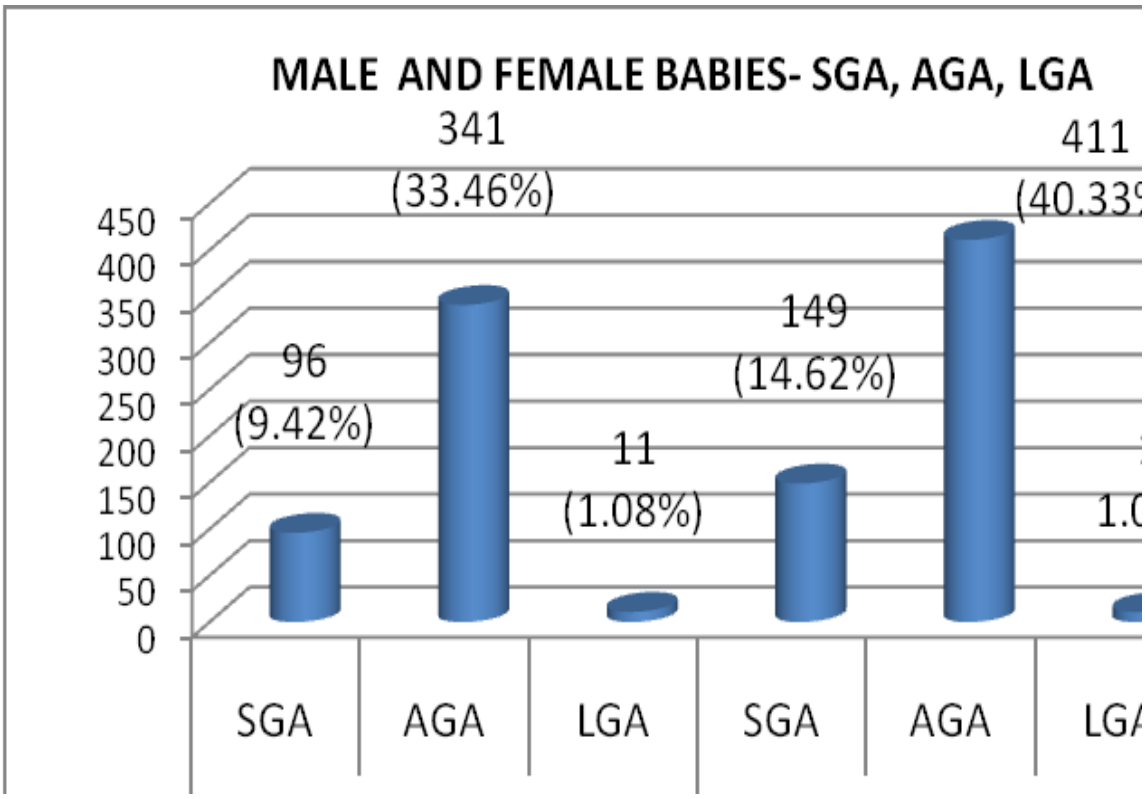


Table V. Sex Wise Analysis of birth of babies.

Sex of the baby	Babies	
	No.	%
Male	448	43.96
Female	571	56.04
Total	1019	100

44% of the babies born were males and 56% were females.

Table VI. Sex vs outcome of babies.

SEX	Alive		Dead	
	No.	%	No.	%
Male	347	77.46	101	22.54
Female	463	81.09	108	18.91
'P'	0.6021 Not Significant			

Sex of the baby born does not have a do not have statistically significant relationship with its birth weight.('p' > 0.05)

CHART 5

Birth Asphyxia

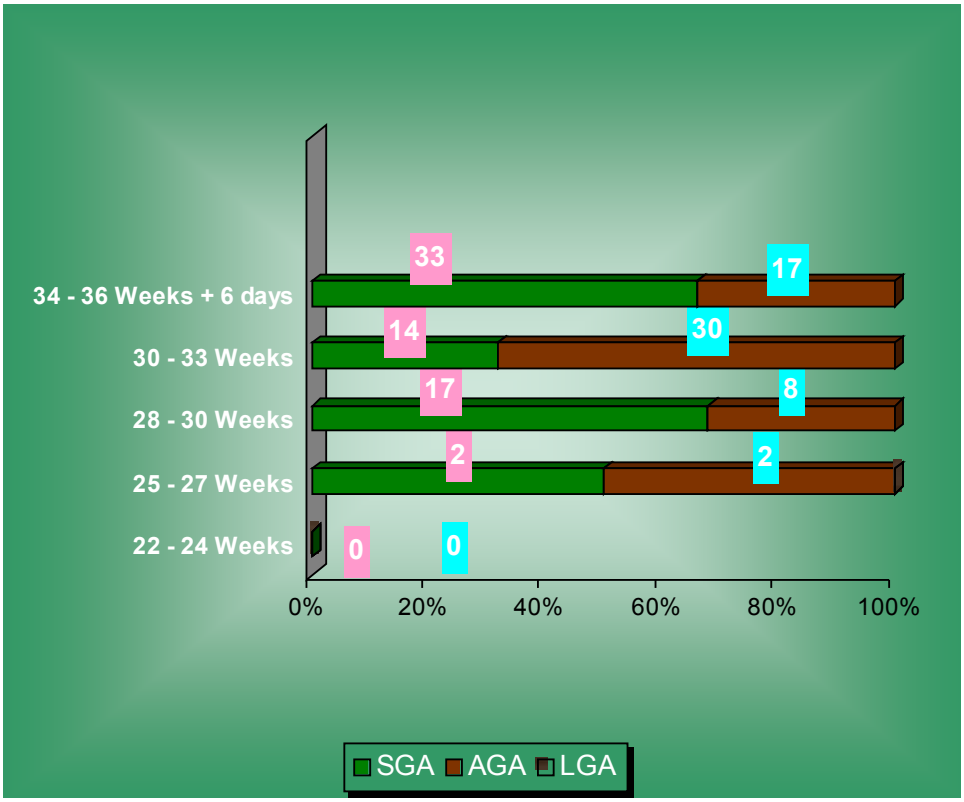


Table VII Birth asphyxia

Status	Birth Asphyxia												Vent. Support	
	22-24		25-27		28-30		31-33		34-36		Total			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
SGA	-	-	2	3	17	25.7	14	21.3	33	50	66	26.9	38	57.6
AGA	-	-	2	3.7	8	14	30	52.5	17	29.8	57	7.6	23	40.4
LGA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	-	-	4	3.3	25	20.3	44	35.8	50	40.6	123	12.1	61	49.9

SGA babies require ventilatory support more than AGA babies

Table VIII Morbidity parttern of preterm babies.

Morbidity pattern	Babies	
	No.	**%**
Respiratory Distress		
1.HMD	**565**	**55.45**
2.CHD	48	4.71
3.Asphyxia	44	4.32
4.Pneumonia	33	3.24
Preterm Care	**545**	**53.48**
Neonatal Hyperbilirubinemia		
1. Phototherapy	**310**	**30.42**
2. Exchange Tranfusion	30	2.94
Metabolic abnormalities		
1. Hypoglycemia	137	13.44
2. Hypocalcemia	116	11.38
Congenital Heartdisease		
1. Acyanotic	50	4.91
2.Cyanotic	11	1.08
Congenital Malformations		
1.Cleftlip	23	2.26
2.Cleft palate	25	2.45
3.CTEV	29	2.85
4.TEF	15	1.47
5. Multiple Anomalies	16	1.57
Sepsis		
1.Early	35	3.43
2.Late	21	2.06
Birth Asphyxia		
1.Mild	9	0.88
2.Moderate	58	5.69
3.Severe	56	5.50

55.45% babies were HMD, 53.48% were admitted for preterm care, 30.42% were admitted for Phototheropy for neonatal hyperbilirunemia

Table IX Hospital stay

Hospital stay in (in days)	Range	Mean	S.D.
NICU	1-20	4.7	3
Mother's room	0-23	2.9	6.8
Total	0-23	7.6	4.5

The babies hospital stay in NICU ranged from 1 – 20 days with a mean of 4.7 and in mothers room from 0 – 23 days with a mean of 2.9

Table X. Mortality of babies

Sex	**Male**		**Female**	
SGA	**54**	56.25	**71**	**47.65**
AGA	**47**	**13.78**	**37**	**9.00**
LGA	0	0	0	0
TOTAL	101	22.54	108	18.91

Mortality was more among SGA babies in both sexes.

CHART 6

Birth Weight and outcome of babies

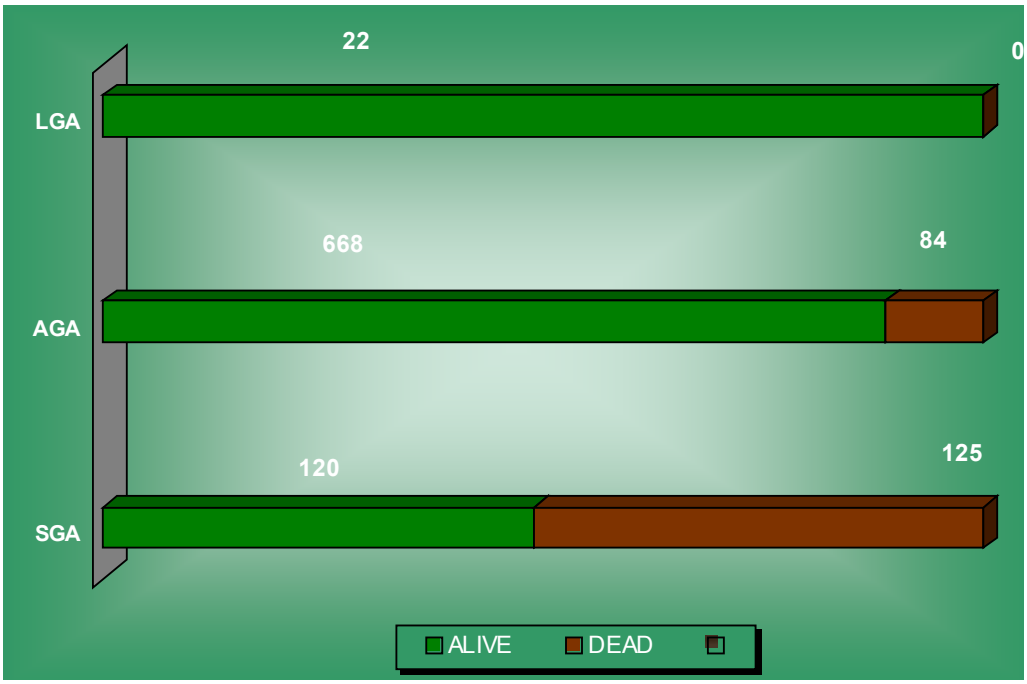


Table XI. Mortality Analysis.

Birth Weight	Alive		Dead	
	No	**%**	**No.**	**%**
SGA	120	49	125	51
AGA	668	89.4	84	10.6
LGA	22	100	-	-
'p'	**0.0001 Significant**			

There is statistically significant difference in the mortality rates of children belonging to the three Birth weight groups.

CHART 7

Causes of Mortality

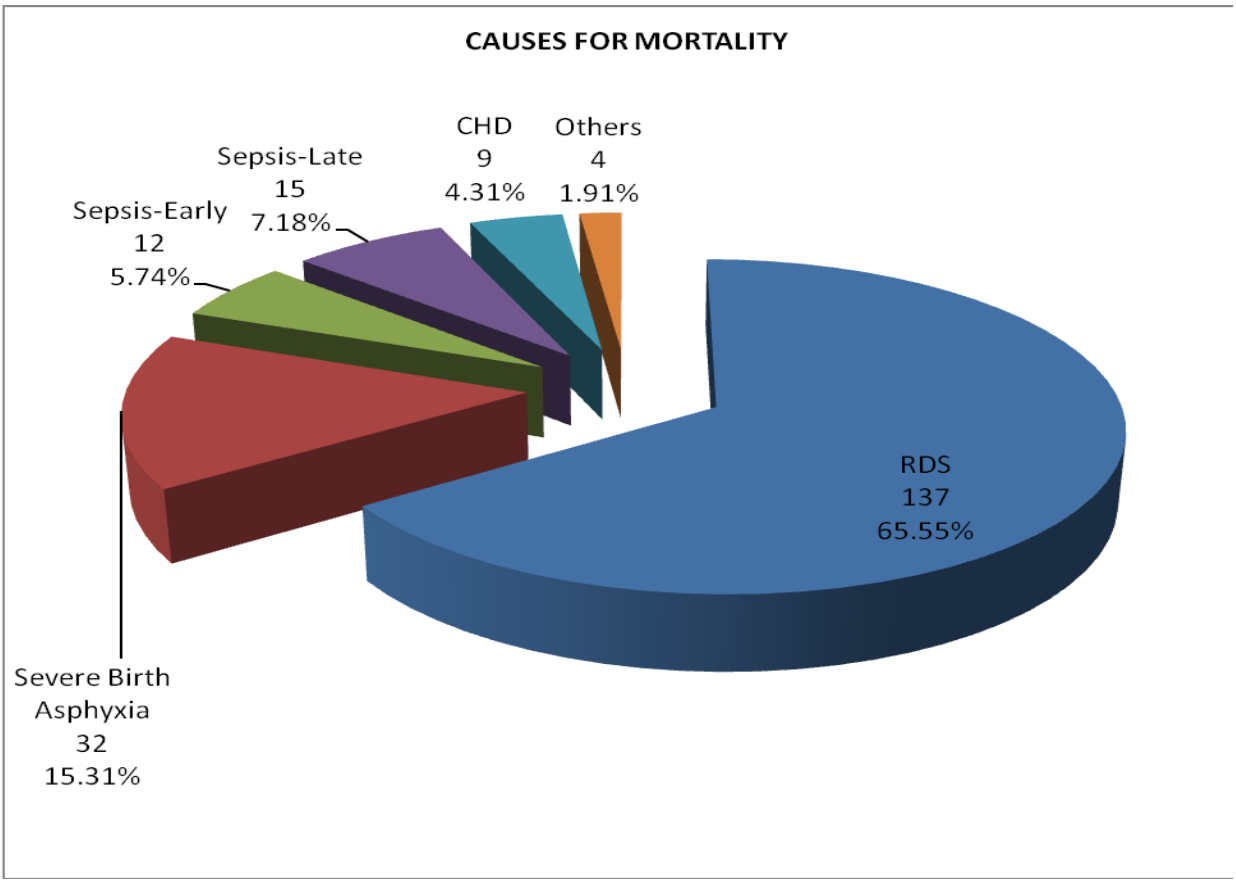


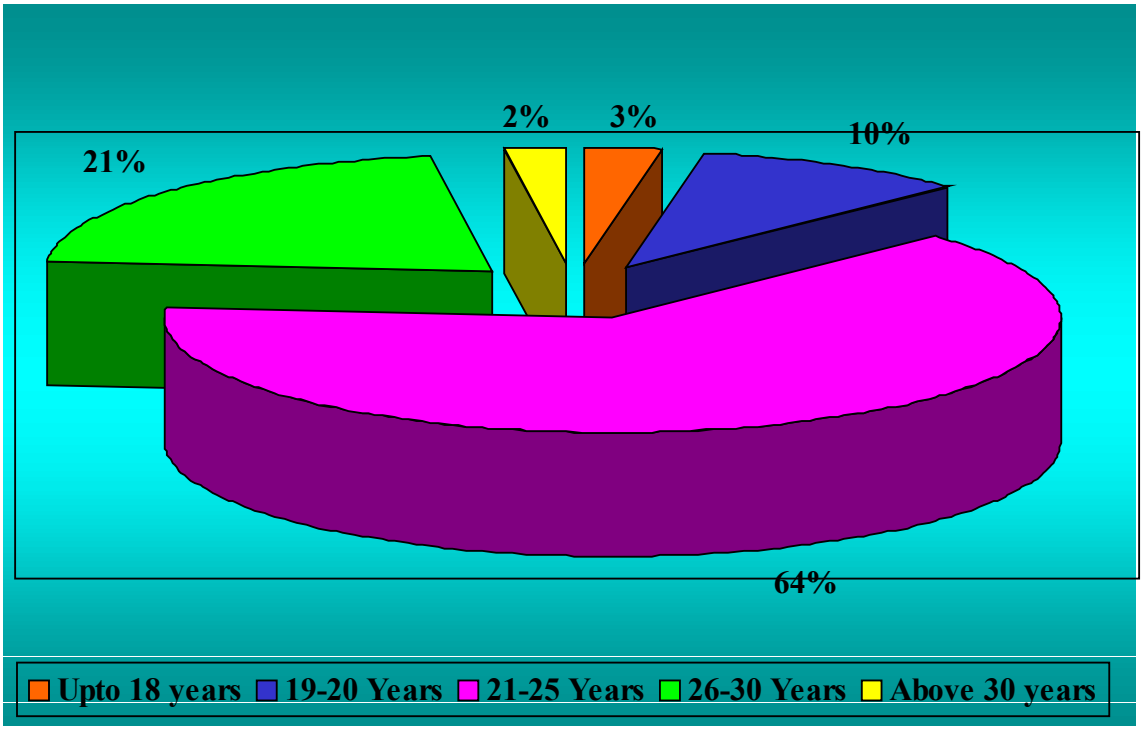
Table XII Causes of mortality

Causes	Dead babies	
	No.	**%**
RDS	137	65.55
Severe Birth Asphyxia	32	15.31
Sepsis		
1. Early	12	5.74
2. Late	15	7.18
CHD	9	4.31
Others	4	1.91

Major cause of mortality was RDS

CHART 8

Maternal age distribution.



ANALYSIS OF MOTHERS OF PRETERM BABIES

Table XIII Age of the mother

Age in years	Mothers	
	No.	%
Upto 18 years	25	2.7
19-20	94	10
21-25	598	63.8
26-30	199	21.3
Above 30	21	2.3
Total	937	100
Range	16-42 years	
Mean	23.7 years	
S.D.	3.2 years	

Majority of the mothers belonged to 21-30 age group. There were 25 (2.7%) mothers aged 18 years and less. The age of the cases studied was 23.7 $\pm$ 3.2 years.

Table XIV Correlation between maternal age & birth weight of babies.

Mother's age in years	Birth Weight(in kgs)	
	Mean	**S.D.**
Upto 18	1.71	0.61
19-20	1.85	0.6
21-25	1.91	0.55
26-30	1.78	0.55
Above 30	1.7	0.59
'p'	**0.0122** **Significant**	

As mother's age increased birth weight also increased upto 25 years and then it declined. There was statistically significant relationship between age of mother and birth weight of the baby.

Table XV Maternal age & Outcome of Babies

Outcome of Babies	Age of mother	
	Mean	**S.D.**
Alive	23.74	3.26
Dead	23.64	2.96
'p'	0.6904 Not significant	

Maternal age and outcome of delivery do not have statistically significant relationship.

CHART 9

Socio – economic status of mothers

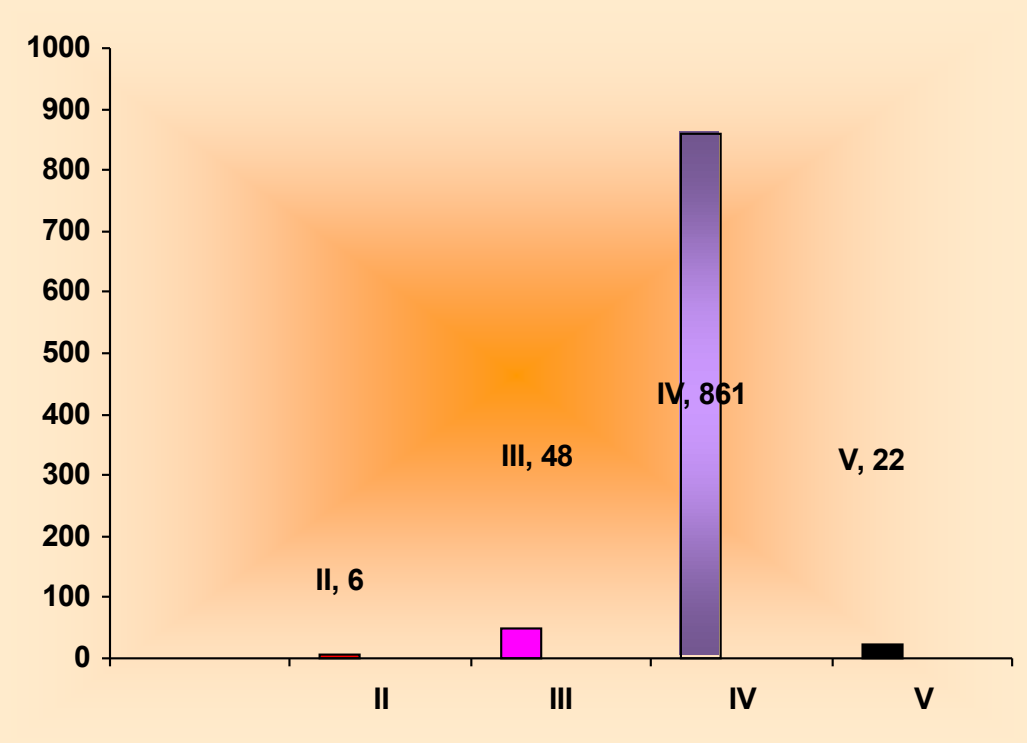


Table XVI Socio – Economic Status

SES	Mothers	
	No.	%
Class I	-	-
Class II	6	0.
Class III	48	5.12
Class IV	861	91.89
Class V	22	2.35
Total	937	100

Most of the cases (92.3%) belonged to the IVth Socio Economic Class

CHART 10

Socio – economic status and outcome of babies

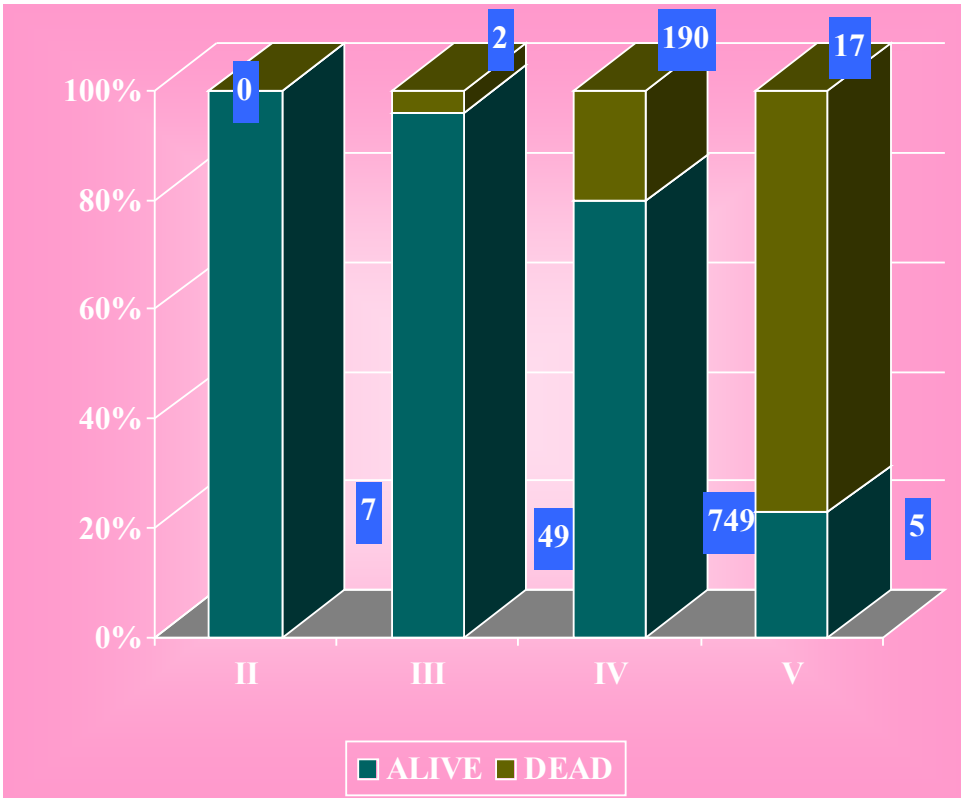


Table XVII Correlation between SES & Birth weight of babies.

SES	Birth Weight (in kg)	
	Mean	**S.D.**
Class II	2.0	0.51
Class III	2.0	0.53
Class IV	1.86	0.56
Class V	1.35	0.52
'p'	**0.0015** **Significant**	

Children of mothers belonging to IV and V socio economic status had lower birth weight than the other groups. This difference is also statistically significant. ('p'= 0.0015)

Table XVIII Correlation between SES & Birth weight of babies SGA, AGA and LGA.

SES	Birth Weight (in kg)			
	SGA	**AGA**	**LGA**	**Total**
Class II	1 (14.26%)	6 (85.71%)	0 (0%)	7 (0.64%)
Class III	8 (15.68%)	40 (78.43%)	3 (5.88%)	51 (5.00%)
Class IV	222 (23.64%)	698 (74.33%)	19 2.02%)	939 (92.15%)
Class V	14 (63.64%)	8 (36.36%)	0 (0%)	22 (2.15%)

Majority of babies were born to mothers belonging to class IV (92.15%), followed by class III (5%), class V (2.15%) and class II (0.64%)

AGA babies are born more in classes II, III and IV

SGA babies are born more in class V.

Table XIX SES and outcome of babies

SES	Alive		**Dead**	
	No	**%**	**No.**	**%**
Class II	7	100	-	-
Class III	49	96.08	2	3.92
Class IV	749	79.77	190	20.23
Class V	5	22.73	17	77.27
'p'	**0.0014** **Significant**			

Children of lower socio economic groups had higher mortality rates than the other groups. There exists statistically significant relationship between these two variables

Table XX Antenatal Care

Antenatal Care	Mothers	
	No.	%
Received	840	89.9
Not received	97	10.1
Total	937	100

Nearly 90% of the cases had received antenatal care.

Table XXI Correlation between antenatal care and birth weight of babies

Gestational Age	Received			Not Received		
	SGA	AGA	LGA	SGA	AGA	LGA
Birth weight of Babies	161	727	22	84	25	0
% of babies born in each head	17.69	79.89	2.42	77.06	22.94	0
TOTAL	910			109		
% From Total Babies born	89.29			10.71		

89.29% babies were born to mother was received antenatal care and 109 babies were born to mothers who had not received antenatal care.

AGA babies are born more in mothers who received antenatal care and SGA babies are born more in mothers who had not received antenatal care.

Table XXII Antenatal care and outcome of babies

Gestational Age	Received			Not Received		
	SGA	AGA	LGA	SGA	AGA	LGA
Mortality of Total babies in each head	**62**	**75**	**0**	**63**	**9**	**0**
% of Mortality in Each head from birth	6.81	8.24	0	57.80	8.26	0
TOTAL	**137**			**72**		
% Of Mortality of babies born in Each head	**15.05**			**66.06**		

Mortality was high among SGA babies whose mothers had not received antenatal care.

CHART 11

Antenatal care and outcome of babies

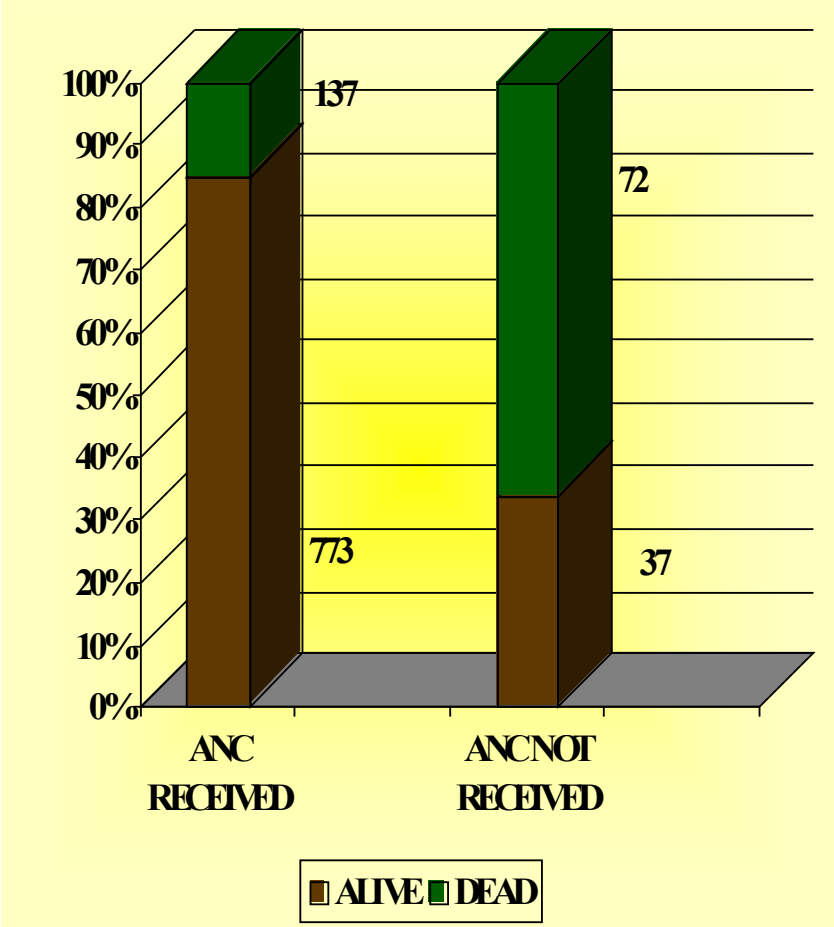


Table XXIII Correlation between maternal weight gain and birth weight of babies

Maternal Weight gain (in kgs)	**Birth Weight(in grams)**	
	Mean	**S.D.**
1-5	1.33	0.43
6-8	2.04	0.43
9-12	1.93	0.59
'p'	**0.0001 Siginficant**	

As maternal weight increases, baby's birth weight also increases. This increase is statistically significant. ('p'= 0.0001)

CHART 12

Maternal weight gain and outcome of babies

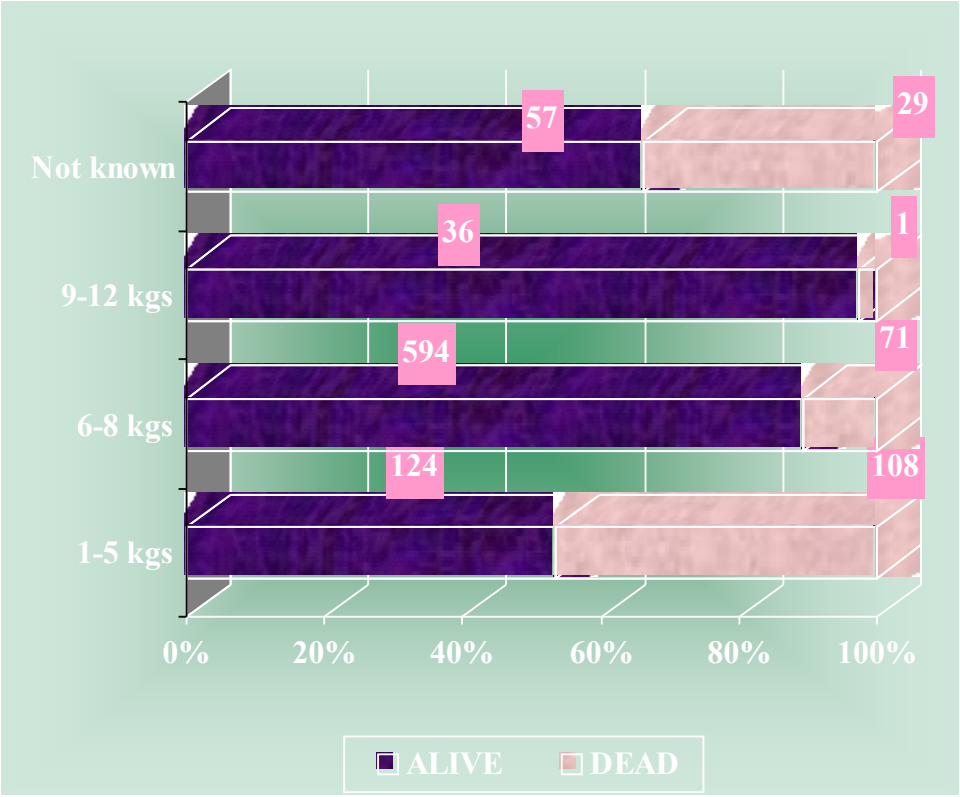


Table XXIV Maternal weight gain and outcome of babies

Maternal weight gain (in kgs)	Alive		**Dead**	
	No	**%**	**No.**	**%**
1-5Kgs	124	53.45	108	46.55
6-8Kgs	594	89.32	71	10.68
9-12Kgs	35	97.22	1	2.78
Not known	57	66.28	29	33.72
'p'	**0.0001 Significant**			

As maternal weight gain increases, mortality rates decline. The relationship is do statistically significant. ('p' = 0.0001)

Table XXV Previous Obstetric history of mothers

Previous Obstetric History	Mothers	
	No.	%
Abortion Induced	19	2.03
Abortion Spontaneous	75	8.00
Previous Still birth	19	2.03
Previous Preterm Labour	88	9.39
Total Bad Obst.History	201	21.5
No BOH	736	78.5

21.5 % of mothers had bad obstetric history and the remaining 78.5% had normal history.

Table XXVI Previous BOH and outcome of babies

BOH	Alive		Dead	
	No	**%**	**No.**	**%**
Present	167	83	34	17
Absent	590	80.3	146	19.7
‘p’	0.4061 Not significant			

There was not significant relationship between BOH and outcome of babies.

Table XXVII Maternal & Fetal Risk Factors

Risk Factors	Mothers	
	No.	**%**
Maternal		
Medical illness		
Pre Eclampxia	54	5.76
Eclampsia	43	4.60
PIH	**308**	**32.87**
Anaemia	104	11.10
Heart Disease	9	0.96
Diabetesmellitus	18	1.92
Vaginal inf. / UTI / PROM	**188**	**20.06**
APH I	14	1.49
APH II	19	2.03
APH III	49	5.23
Uterine		
Bicornuate Ut., / Malformation	17	1.81
Cervical incompetence	28	2.99
Others		
Stress	36	3.84
Physical Exertion	49	5.23
Fetal		
Multiple Pregnancy	**74**	**7.90**
Congenital malformation	40	4.27
UnKnown	77	8.22

PIH contributed to 32.87% followed by vaginal inf. / UTI / PROM 20.06% and Multiple pregnancy 7.9%.

Table XXVIII Treatment profile

Treatment profile	Mothers	
	No.	%
Tocolytic	86	9.2
Betamethasone	120	12.8

12.8% - Betamethasone

9.2% Tocolytic

Table XXIX Type of delivery

Type of delivery	Deliveries	
	No.	%
Labor natural	715	76.3
Assisted Breech	38	4.1
LSCS	184	19.6
Total	937	100

Nearly 20% of the deliveries required surgical intervention.

CHART 13

Type of Delivery

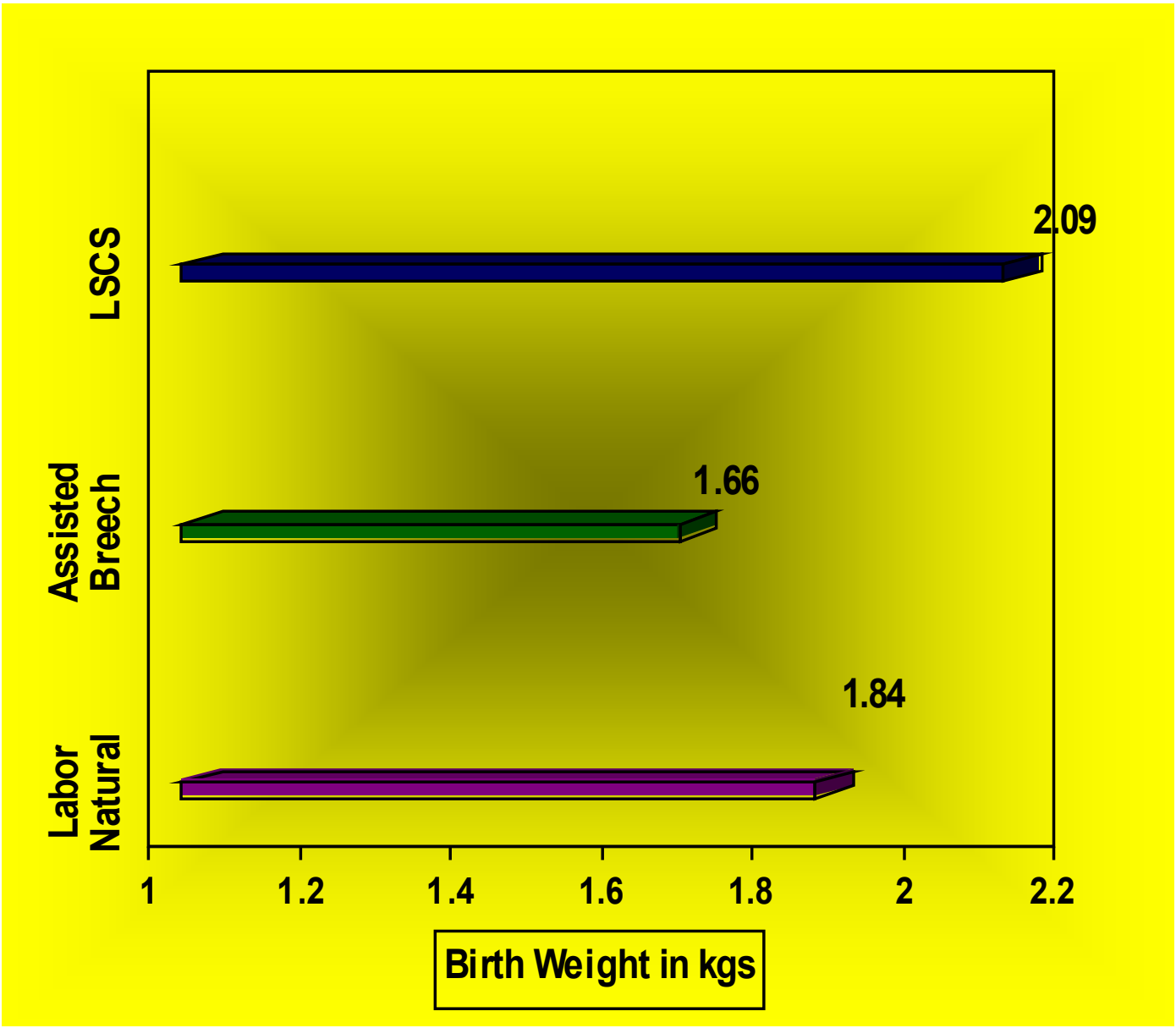


Table XXX Type of delivery and birth weight

Type of delivery	Birth Weight	
	Mean	**S.D.**
Labor Natural	1.84	0.57
Assisted Breech	1.66	0.42
LSCS	2.09	0.5
'p'	**0.0001** **Significant**	

Children delivered by LSCS had the maximum birth weight. This difference is statistically significant.('p'= 0.0001)

Table XXXI Type of delivery and outcome of babies

Type of Delivery	Alive		**Dead**	
	No	**%**	**No.**	**%**
Labor natural	560	78.3	155	21.7
Assisted Breech	33	87.1	5	12.9
LSCS	165	89.9	29	10.1
'p'	0.0635 Not significant			

There was no significant relationship between type of delivery and outcome of babies.

DISCUSSION

DISCUSSION

BABIES

Preterm delivery is defined as delivery before 37 weeks of gestation or before 259 days according to WHO. Preterm babies who are small for gestational age and born < 32 weeks of gestation are of major concern because of maximum perinatal morbidity and mortality found in this group.

Incidence

Incidence of preterm delivery varies between countries and is 12.3% in a study by martin et al (USA), 7% by Bibby and stewart et al (UK), 5.5% by Robert et al (Australia), while in India varies between 10 – 69% and in Singh uma et al study it was 20.9%, and in this study it is 8.90%, reflecting a better antenatal care received by mothers. It is low in this Study, as it is a metro politon city and there are various Govt., Schemes benefiting the antenatal mothers and medical awareness is more in women residing at urban area than rural area.

Birth weight wise analysis and gestational age wise analysis

Out of the 1019 babies born, SGA 24.04% , AGA 73.80% and LGA 2.16%. Baby born between 22- 27 Weeks was 21(2.05%), 28 – 33 Weeks 417 (40.93%) and 34 – 36 Weeks + 6 days 581 (57.02%). In a study done at louis

Packard children hospital was < 28 Weeks (6%), between 28 – 33 Weeks (23%), and 34

– 36 Weeks + 6 days (71%).

All preterm babies are at risk for health problems, but those born < 32 Weeks face highest risk. These babies are very small, organs are less developed but with improved NICU care, chance of survival have improved even in these smallest babies. In this study outcome was poor in babies born less than 30 weeks.

Sex Analysis of babies

Sex of the baby	Babies	
	No.	**%**
Male	448	43.96
Female	571	56.04
Total	1019	100

448 (43.96%) babies born were male and (56.04%) babies born were female showing female preponderance, which was similar to the study by Roy KK et al but in singh uma et al study, gender difference favoured male. In a study by John Toyson et al, weight, sex affects early preterm survival. In that study, asides the baby's gestational age, other four factors (i.e. sex, Single/ Multiple births, Mother received corticosteroids, birth weight) may affect their odds of survival. It was found than female, singletons, mother had received corticosteroids and higher birth weight had better survival.

ANANLYSIS OF MORBIDITY PATTERN

The morbidity patten in this study was HMD (55.45%), Preterm care (53.48%) and neonatal hyperbilirubinemia for Phototheraphy (30.42%) Hypoglycamia (13.44%),

which was more or less comparable to study by Sehgal et al, where neonatal hyperbilirubinemia (78%) and RDS (65%) were the most common causes of morbidity and in a study by Aravind sehgal et al, HMD (65%) and neonatal hyperbilirubinemia (78%) and hypoglycemia (38%) were the most common causes.

Analysis of Babies requiring ventilator support among preterm babies.

In this study, babies requiring ventilator support was 57.88% SGA and 40.35% AGA and between 25 – 30 Weeks required more ,which in Roy K.K. et al, study it was 83.3% in ELBW babies and 40% in VLBW group, indicating SGA babies and babies born <32 weeks required ventilator support more when compared to others.

Analysis of mortality among preterm babies

In this study, Mortality of babies was more among male (22.54%) when compared to female as for as SGA, AGA, LGA was considered. The overall mortality was 20.5% in this study, which was 12.7% in Singh uma et al, study and in Aravind sehgal study, overall mortality rate among ELBW and VLBW was 43% and it was 15% in VLBW and 31% ELBW babies in Roy K.K. et al, study.

In this study, survival rate was better in female babies than male which is similar to the study by Roy K.K. et al while in Arivind sehgal et al, favored male babies. Gestational age and birth weight was higher in survivals as compared to non – survivals indicating that they have more mature organs and were better equipped to with stand the transition from intrauterine to extra uterine life.

In this study, the causes for the mortality are RDS (65.5%), severe birth asphyxia

(15.31%) and Sepsis (12.8%), which was similar to the study by Singh uma et al, it was RDS (62%) Septicaemia (16.8%) and Hypoxic ischaemic encephalopathy (9.2%), in a study by Roy K.K. et al, major causes of mortality are RDS, intracranial heamorrhage and sepsis (20.3%). In a Study by Michael G Ross et al, RDS, IVH and Sepsis were the major causes of mortality and it was more in babies born in lower Gestational ages.

MOTHERS FACTORS vs BABIES OUTCOME

Total mothers analysed in this study are 937.

Age

Age of mother ranged between 16 – 42 years. Mean age of the mother was 23 .7 years. 63.8% babies were born to mothers between 21 – 25 years of age. As for as birth weight was correlated with age of the mothers, as mothers maternal age increased from lower to mean age, birth weight was in increasing order and from mean age to higher age, birth weight was in decreasing order, but in studies by Singh uma et al and Roy K.K. et al, maternal age between 18 – 35 years had better outcome.

Socio – Economic class

In this study, mothers belonged to Socio–economic class of IV (91.89%), III (5.12%) and V (2.35%), and on analyzing the babies born in these classes of mothers, SGA babies are born on an increasing order from II socio-economic class to IV socio-economic class and AGA babies on a decreasing order from II socio-economic class to IV socio-economic class. On analysing the mortality of babies born in these classes of mothers, AGA and SGA babies born in class V had higher mortality than in class IV and thus, Socio–economic status has an influenze over birth weight and outcome of the babies. This is similar in the studies by Michael G Ross et al and Singh Uma et al where Socio–economic class IV and V predominates.

Antenatal Care

Antenatal care received by mothers in this study are 89.65% and not received are 10.35%. It is found that those mothers who received antenatal care had more of AGA babies and those not received had more of SGA babies, thus implying that antenatal care has influenze over the birth weight and mortality of babies, (66.06%), This is similar to the study by Arvind sehgal et al, where mothers who did not received antenatal care had unfavourable outcome (60%) than those received antenatal care (27%). In a study by Singh uma et al and Diallo et al, they state that 83% of maternal causes could be controlled by efficient prenatal care.

Maternal Weight gain

It was found that 65.31% mothers gained weight between 6 – 8kgs, 24.01% mothers gained weight between 1 – 5Kgs, 2.77% mothers gained weight between 9 – 12Kgs and in 7.90% weight gain was not known in mothers. On analysing maternal weight wise babies born, mothers with weight gain between 1 – 5Kg had more of SGA babies and those between 6 – 8Kgs had more of AGA babies. The mean birth weight of babies for 1 – 5Kgs was 1.33. for 6 – 8kgs was 2.04, for 9 -12Kgs was 1.93. SGA babies were more between 9 – 12Kgs than between 6 – 8Kgs as they was more of multiple pregnancy under this head and the birth weight of the babies got shared resulting in an increase in SGA babies when compared with 6 – 8Kgs and under weight unknown head, 50% of SGA and AGA babies were born, implying that the maternal weight gain had influenze over the birth weight of the babies and as for as mortality was

considered, 46.55% babies had died in maternal weight gain between 1 – 5Kgs, which is more when compared to 33.72% in unknown, and 10.68% between 6 – 8Kgs and 2.78% between 9 – 12Kgs and it is statistically significant.

This factor was similar in other studies by Singh uma et al, Roy K.K. et al, where with the better maternal weight gain, the outcome was good.

Previous History of Preterm mothers

When the previous history of the mothers who delivered preterm babies was analysed, there was an association with previous preterm labour in 9.39%, previous still birth in 2.03% and Abortions – Spontaneous in 8% and induced in 2.03%.

Study	Factor	%
Aravind Sehgal et al	Previous preterm delivery	57%
Roy K.K et al	Previous preterm delivery	48.2%
Michael G Ross et al	Previous preterm delivery	45%
Singh uma et al	Previous preterm delivery	14.4%
Singh uma et al	Abortions	14.4%

Analysis of maternal and fetal factors for preterm birth

In this study, the most three common factors are PIH (32.87%), Vaginal infection / UTI / PROM (20.06%) and Multiple pregnancy (7.9%). While in Singh uma et al study, PROM followed by UTI was found to be the major risk factor for preterm labour.

Study	Causes	%
Gonclaves et al	UTI	25
Lamont et al	UTI	40
Wright et al	UTI	7
Singh um et al	PROM	25.9
Carey and klebanoff et al	UTI	20
Roy K.K et al	Anemia	32.6
Aravind sehgal et al	Anemia	65

Treatment Profile

When the treatment profile of the mothers was analysed, 9.18% had received tocolytics to prolong the labour and the labour was prolonged in these mothers from few days to weeks and in this study only <10% had received tocolytics and in a study by Roy K.K. et al, about 22.2% had received tocolytics.

When mothers who received betamathasone was analysed, about 12.8% had received and 87.19% had not received, to prolong lung maturity, so that the babies can overcome the respiratory distress syndrome and it was found that mothers who received betamethasone were in advanced gestational weeks and this should be encouraged to be given even to lower gestational weeks as there are literature evidences that though it can be beneficial only if there is atleast a time duration of 6 hours, it can be given to mothers

who are going to deliver within a few hours. The neonatal morbidity was high (30.98%) who were steroid uncovered in babies < 34 weeks in a study by Singh uma et al, and less (29.16%) in those steroid covered < 34 weeks.

Delivery Outcome

As for as the delivery was analysed, in this study 76.3%, had delivered by labour natural, 19.64% by LSCS and 4.06% by Assisted breach which is in contrast to the study by Roy K.K. et al, where LSCS was very high (67.3%).

CONCLUSION

CONCLUSION

1. Incidence of preterm delivery in this study was 8.9%.
2. AGA babies born were more when compared to SGA and LGA babies.
3. Babies born in advanced gestational ages were more when compared to lower gestational ages.
4. Female babies out numbered male babies both by birth and survival.
5. HMD/ RDS, neonatal hyperblirubinemia are the common neonatal morbidities.
6. The overall mortality rate was 20.5% and mortality was high among male SGA and AGA when compared to female SGA and AGA babies and born at lower gestational ages when compared to advanced gestational ages.
7. RDS, Severe birth asphyxia and sepsis are the most common causes of mortality.
8. Babies born in lower gestational ages and SGA babies required Ventilatory support more than others.
9. All efforts should be made to prolong the pregnancy beyond 34 weeks for better neonatal outcome.
10. Better socio-economic status of the mothers, antenatal care of the mothers, maternal weight gain of the mothers during pregnancy has infuenzes over the birth weight of the babies, however age had got no significant influenze.
11. PIH, PROM/ UTI/ Vaginal infections and multiple pregnancy contributed major maternal and fetal risk factors .
12. There is association with previous history of abortions and preterm births.

13. Some of these risk factors are remediable if adequate antenatal care and timely intervention are done.

LIMITATIONS AND RECOMMENDATIONS

LIMITATIONS

1) This study was done in a tertiary care centre where more number of mothers with complications were referred and this factor may have impact on the morbidity and mortality pattern of the study.

2) In this study, there were no control groups to assess the relative risk.

RECOMMENDATIONS

1) Prevention of early birth is the best way of promoting good health for babies and it can e achieved by giving adequate care to the females since early childhood and adolescence by promoting better nutrition and health care.

2) Prenatal care is a key factor in preventing preterm births and low birth weight babies.

3) Prenatal care should be adequate to promote the maternal nutrition and weight gain.

4) Prenatal care is also important in identifying the problems and lifestyles that can increase the risks for preterm labour and birth.

5) All efforts should be made to prolong the pregnancy beyond 34 weeks for better neonatal outcome.

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PROFORMA

Proforma for Mother

MATERNAL ANTENATAL PROFILE

1) NAME: 2) AGE: 3) D.O.A. :

4) ADDRESS:

5) LMP: 6) EDD: 7) DOD:

8) GRAVIDA: PARA: ABORTIONS:

9) HEIGHT: WEIGHT:

10) DEMOGRAPHIC PROFILE: (SOCIO ECONOMIC STATUS) (MODIFIED KUPPUSAMY SCALE)

OCCUPATION: EDUCATION: PERCAPITA INCOME:

CLASS:

11) **ANTENATAL PROFILE**

i) BOOKED/ NOT:

ii) IMMUNISED/NOT:

iii) RECEIVED IRON /FOLATE / VITAMINS / MINERALS:

iv) MATERNAL WEIGHT GAIN DURING PREGANNCY:

v) DRUG INTAKE DURING PREGNACY:

12) RISK FACTORS:

I) MATERNAL

(A) MATERNAL DISEASES DURING PREGNANCY

i) PRE-ECLAMPSIA /ECLAMPSIA

ii) PIH /HT COMP.PREGNANCY

iii) ANAEMIA

iv) HEART DISEASE COMPLICATING PREGNANCY

v) GESTATIONAL DM / DM COMPLICATING PREGNACY

vi) VAGINAL INFECTION/ UTI PROM

vii) ANTEPARTUM HAEMORRHAGE

I

II

III

viii) TUBERCULOSIS

Cont…,

(B) UTERINE / CERVICAL FACTORS

i) BICORNUATE UTERUS/ UTERINE MELFORMATIONS

ii) CERVICAL INCOMPETENCE

(C) OTHERS

i) MALNUTRITION ii) STRESS iii) SMOKING

iv) PHYSICAL EXERTION v) SEXUAL ACTIVITIES vi) ALCOHOL

II) FETAL FACTORS

i) MULTIPLE PREGNANCY

ii) CONGENITAL MALFORMATIONS

III) i)PREVIOUS ABORTIONS (SPONT / INDUCED)

ii) PREVIOUS STILL BIRTHS

iii) PREVIOUS PRETERM LABOUR

13) TREATMENT PROFILE: USE OF TOCOLYTICS / BETAMETHASONE (SPECIFY)

14) DELIVERY OUTCOME: i) LABOR NATURAL

ii) LN WITH EPSIOTOMY

iii) LSCS

15) DEFINITE CAUSE OF PRETERM LABOUR:

Proforma for Baby

Singleton, twin 1 & triplet 1

IMMEDIATE OUTCOME (NEONATAL MORBIDITY & MORTALITY) OF PRERERM BABIES TILL DISCHARGE.

1) B/O: 2) SEX: 3) ID NO.:

3) CONSANGUINITY / NON-CONS. 5) D.O.B.: 6) T.O.B.:

7) M.O.B.: 8) BIRTH WEIGHT:

9) GESTATIONAL AGE :(NEW BALLARD SCORE)

PHYSICAL: SCORE:

NEUROMUSUCULAR: TOTAL:

10) BIRTH ASPHYXIA: PRESENT / NOT:

11) CHILD ON VENTILATORY SUPPORT / NOT:

12) BRIEF DETAILS OF RESUSITATION:

13) GENERAL EXAMINATION:

A) POSITION:

B) VITALS:

i) TEMPERATURE ii) HR iii) RR iv) CRT

v) PERIPHERAL PULSES

C) ANTHROPOMETRY:

i) WEIGHT: a) SGA : b) AGA : c) LGA :

ii) LENGTH: iii) HEAD CIRCUMFERENCE:

iv) CHEST CIRCUMFERENCE: v) MID ARM CIRCUMFERENCE:

vi) FOOT LENGTH: vii) FUNDUS EXAMINATION:

D) SKULL: E) EYES: F) EARS: G) NOSE:

H) MOUTH: I) NECK: J) SKIN:

K) UMBILICAL CORD: L) GENITALIA: M) ANUS:

N) SPINE: O) ARMS & LEGS: P) HIPS:

Q) HERNIAL ORIFICES:

R) CONGENITAL MALFORMATION (SPECIFY):

14) SYSTEMIC EXAMINATION:

I) RESPIRATORY SYSTEM:

II) CVS:

III) ABDOMEN:

IV) CNS:

15) CLINICAL DIAGNOSIS:

i) BIRTHASPHYXIA:

ii) SEPSIS EARLY ONSET LATE ONSET

iii) RESPIRATORY DISTRESS

iv) NEONATAL HYPERBILIRUBINEMIA:

v) METABOLIC ABNORMALITIES

vi) CONGENITAL HEART DISEASE:

vii) CONGENITAL MALFORMATIONS

16) INVESTIGATIONS:(IF WARRANTED)

I) CBC IN COUNTER a) HB% b) TC c) DC d) PCV:

e) PLATELETS f) MCV g) MCH h) MCHC

II) CRP III) BLOOD CULTURE

IV) XRAY CHEST & ABDOMEN:

V) RFT a) BLOOD SUGAR: b) BLOOD UREA c) SR.CREATININE:

d) SR.ELECTROLYTES: i) SODIUM

ii) POTASSIUM iii) BICARBONATE iv) CHLORIDE

VI) SR.CALCIUM: VII) BLOOD GROUPING & RH TYPING:

VIII) SR.BILIRUBIN TOTAL DIRECT INDIRECT

IX) USG CRANIUM: X) ECG: XI) ECHO:

XII) OTHERS:

17) TREATMENT GIVEN:

18) STAY IN: i) N ICU: ii) MOTHER'S ROOM:

19) TOTAL HOSPITAL STAY:

20) DEFINITE CAUSE OF MORTALITY:

IMMEDIATE OUTCOME (NEONATAL MORBIDITY & MORTALITY) OF PRERERM BABIES TILL DISCHARGE.

1) B/O: 2) SEX: 3) ID NO.:

3) CONSANGUINITY / NON-CONS. 5) D.O.B.: 6) T.O.B.:

7) M.O.B.: 8) BIRTH WEIGHT:

9) GESTATIONAL AGE :(NEW BALLARD SCORE)

PHYSICAL: SCORE:

NEUROMUSUCULAR: TOTAL:

10) BIRTH ASPHYXIA: PRESENT / NOT:

11) CHILD ON VENTILATORY SUPPORT / NOT:

12) BRIEF DETAILS OF RESUSITATION:

13) GENERAL EXAMINATION:

A) POSITION:

B) VITALS:

i) TEMPERATURE ii) HR iii) RR iv) CRT

v) PERIPHERAL PULSES

C) ANTHROPOMETRY:

i) WEIGHT: a) SGA : b) AGA : c) LGA :

ii) LENGTH: iii) HEAD CIRCUMFERENCE:

iv) CHEST CIRCUMFERENCE: v) MID ARM CIRCUMFERENCE:

vi) FOOT LENGTH: vii) FUNDUS EXAMINATION:

D) SKULL: E) EYES: F) EARS: G) NOSE:

H) MOUTH: I) NECK: J) SKIN:

K) UMBILICAL CORD: L) GENITALIA: M) ANUS:

N) SPINE: O) ARMS & LEGS: P) HIPS:

Q) HERNIAL ORIFICES:

R) CONGENITAL MALFORMATION (SPECIFY):

14) SYSTEMIC EXAMINATION:

I) RESPIRATORY SYSTEM:

Cont…,

II) CVS:

III) ABDOMEN:

IV) CNS:

15) CLINICAL DIAGNOSIS:

i) BIRTHASPHYXIA:

ii) SEPSIS EARLY ONSET LATE ONSET

iii) RESPIRATORY DISTRESS

iv) NEONATAL HYPERBILIRUBINEMIA:

v) METABOLIC ABNORMALITIES

vi) CONGENITAL HEART DISEASE:

vii) CONGENITAL MALFORMATIONS

16) INVESTIGATIONS:(IF WARRANTED)

I) CBC IN COUNTER a) HB% b) TC c) DC d) PCV:

e) PLATELETS f) MCV g) MCH h) MCHC

II) CRP III) BLOOD CULTURE

IV) XRAY CHEST & ABDOMEN:

V) RFT a) BLOOD SUGAR: b) BLOOD UREA c) SR.CREATININE:

d) SR.ELECTROLYTES: i) SODIUM

ii) POTASSIUM iii) BICARBONATE iv) CHLORIDE

VI) SR.CALCIUM: VII) BLOOD GROUPING & RH TYPING:

VIII) SR.BILIRUBIN TOTAL DIRECT INDIRECT

IX) USG CRANIUM: X) ECG: XI) ECHO:

XII) OTHERS:

17) TREATMENT GIVEN:

18) STAY IN: i) N ICU: ii) MOTHER'S ROOM:

19) TOTAL HOSPITAL STAY:

20) DEFINITE CAUSE OF MORTALITY:

MASTER CHART

MASTER CHART (Baby factors)

Sl. No.	Gestational Age	Anthropometry			Sex						Morbidity															
		Weight			Male			Female			Birthasphyxia														Seps	
		SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	Mild			Moderate			Severe			ASPHYXIA Requiring Vent Support			Early	
											SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA
1	**22 - 24 Weeks**	2	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	**25 - 27 Weeks**	13	6	-	2	6		11							2		2			4				
3	**28 - 30 Weeks**	55	51	3	20	23		35	28	3				11	6		6	2		9	2		2	
4	**31 - 33 Weeks**	69	233	6	24	89	6	45	144		3			5	14		6	16		6	16		11	8
5	**34 - 36 Weeks + 6 Days**	106	462	13	48	223	5	58	239	8	2	4		12	8		19	5		19	5		10	4
	TOTAL	**245**	**752**	**22**	**96**	**341**	**11**	**149**	**411**	**11**	**5**	**4**	**0**	**28**	**30**	**0**	**33**	**23**	**0**	**38**	**23**	**0**	**23**	**12**

MASTER CHART (Baby factors) – continued

No.	Immediate Outcome (Neonatal Morbidity & Mortality) of Preterm Babies till Dis																											
	Respirative Distress						Neonatal Hyperbilirubinemia						Metabolic Abnormality						Congenital Heart Disease									
	CHD			Asphysia			PT			ET			Hypocalcemia			Hypoglycemia			Acyanotic						Cyan (Spec			
	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA		AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA		
1																												
2				4			5						3	2		4	2											
3	5	2		7	1		30	35	3				10	8	1	16	9	1	4	1		2	1					
4	9	7		4	8		30	60	6	2	4		18	20	2	22	20	2	5	4		4	3		2	2		
5	13	12		16	4		44	97		2	9		22	26	4	25	31	5	6	6		7	6	1	2	2		
	27	**21**	**0**	**31**	**13**	**0**	**109**	**192**	**9**	4	2		**53**	**56**	**7**	**67**	**62**	**8**	**15**	**11**	**0**	**13**	**10**	**1**	**4**	**4**		

MASTER CHART (Baby factors) – continued

Sl. No.	Immediate Outcome (Neonatal Morbidity & Mortality) of Preterm Babies till Discharg																											
	Morbidity												Stay In						Mortality									
													NICU			Mother's Room												
	Cleft Palate			CTEV			TEF			Preterm Care									Yes			No						
	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	SGA	AGA	LGA	
1													2						2									
2													13	6					13	6								
3	2	4		2			2						55	51	3	7	16	3	46	37		7	16	3				
4	2	9		2	10		4	5		8	160	4	69	233	6	33	209	6	36	24		33	209	6				

5	4	4		3	12		4	16		36	326	11	106	462	13	78	445	13	28	17		78	445	13	2
	8	**17**	**0**	**7**	**22**	**0**	**10**	**21**	**0**	**44**	**486**	**15**	**245**	**752**	**22**	**118**	**670**	**22**	**125**	**84**	**0**	**118**	**670**	**22**	**1**

MASTER CHART (Mothers factors)

Sl.No.	Gestational Age	Anthropometry			Demographic Profile (Socio Economic Status) (Modified Kuppusamy Scale)					Antenatal Profile													
		Weight								Received Antenatal Care		Immunised		Maternal Weight Gain During Preganncy				a) Maternal Diseases					
		SGA	AGA	LGA	Class I	Class II	Class III	Class IV	Class V	Yes	Not	Yes	No	1 - 5 Kg	6 - 8 Kg	9 - 12 Kg	Not Known	Pre-Eclampsia	Eclampsia	PIH	Anaemia	H.D.Complicating Pregnancy	
1	22 - 24 Weeks	2	--	--	--	--	--	2	--	1	1	1	1	2	--	--	--	2	--	--	--	--	
2	25 - 27 Weeks	13	6	--	--	--	--	16	3	16	3	16	3	17	2	--	--	--	2	8	4	--	
3	28 - 30 Weeks	55	51	3	--	--	--	95	3	85	13	85	13	45	45	--	8	6	12	30	20	4	
4	31 - 33 Weeks	69	233	6	--	2	18	259	6	249	36	249	36	81	168	8	28	11	11	80	45	1	

5	**34 - 36 Weeks + 6 Days**	106	462	13	--	4	30	489	10	489	44	489	44	80	397	18	38	35	18	190	35	4	
	TOTAL	**245**	**752**	**22**	**0**	**6**	**48**	**861**	**22**	**840**	**97**	**840**	**97**	**225**	**612**	**26**	**74**	**54**	**43**	**308**	**104**	**9**	

MASTER CHART (Mothers factors)

Sl.No.	Gestational Age	Risk Factors							Treatm	
		II. Fetal Factors		Unknown	III Others					
		Multiple Pregnancy	Congenital Malfor-mations		Previous Abortions		Previous Still Births	Previous Preterm Labour	Tocolytic	
					Induced	Spont			Yes	
1	**22 - 24 Weeks**	--	--	--	--	--	--	--	--	2
2	**25 - 27 Weeks**	--	--	--	--	2	--	--	--	1
3	**28 - 30 Weeks**	5	2	6	2	21	2	3	2	9
4	**31 - 33 Weeks**	29	13	26	2	20	8	39	26	25
5	**34 - 36 Weeks + 6 Days**	40	25	45	15	32	9	46	58	47
	TOTAL	**74**	**40**	**77**	**19**	**75**	**19**	**88**	**86**	**85**

ABBREVIATIONS

Sl.No.		ABBREVIATIONS
1	AGA	APPROPRIATE FOR GESTATIONAL AGE
2	APH	ANTEPARTUM HEMORRHAGE
3	CHD	CONGENITAL HEART DISEASE
4	CTEV	CONGENITAL TALIPES EQUINO VARUS
5	ET	EXCHANGE TRANSFUSION
6	GA	GESTATIONAL AGE
7	HMD	HYALINE MEMBRANE DISEASE
8	ICH	INTRACRANIAL HEMORRHAGE
9	IDDM	INSULIN DEPENDANT DIABETES MELLITUS
10	IVH	INTRA VENTRICULAR HEMORRHAGE
11	LGA	LARGE FOR GESTATIONAL AGE
12	LSCS	LOWER SEGMENT CAESAREAN SECTION
13	M.K.Scale	MODIFIED KUPPUSAMY SCALE
14	NICU	NEONATAL INTENSIVE CARE UNIT
15	PDA	PATENT DUCTUS ARTERIOSUS
16	PIH	PREGNANCY INDUCED HYPERTENSION
17	PROM	PREMATURE RUPTURE OF MEMBRANES
18	PT	PHOTOTHERAPY
19	S.E.Status	SOCIO ECONOMIC STATUS
20	SGA	SMALL FOR GESTATIONAL AGE
21	TEF	TRACHEO OESOPHAGEAL FISTULA
22	UTI	URINARY TRACT INFECTION
23	VSD	VENTRICULAR SEPTAL DEFECT